WELCOME TO ABOUT ANGOSTURA

This is the first issue of ***About Angostura***, a periodic newsletter designed to pass on information about the Environmental Impact Statement (EIS) process conducted by the Bureau of Reclamation on water management at Angostura Reservoir. The first issue provides:

- History of the Angostura Unit
- Explanation of the National Environmental Policy Act (NEPA) process
- Alternative plans developed for the EIS with the public's input
- List of recent and future activities

Future issues of ***About Angostura*** will be printed periodically when the need arises. Comments or questions are encouraged. Please address them to **Kenneth Parr, Bureau of Reclamation, P.O. Box 226, Newell, S.D. 57760, Phone (605-456-2695), Fax (605-456-456-2153), or E-mail KPARR@GP.USBR.GOV.**

HISTORY OF ANGOSTURA UNIT

Angostura Unit Facilities

The Angostura Unit was first authorized in 1939, and then re-authorized by the Flood Control Act of 1944. Construction of the dam began in 1946, with completion in 1949. Delivery of water began in 1953, full service in 1956.

On the southeast edge of the Black Hills, Angostura Dam and Reservoir straddle the Cheyenne River near the mouth of the Red Canyon. The reservoir extends 17 miles along the Cheyenne River and 7.6 miles up Horsehead Creek, a major tributary. Unit lands extend along the river from the dam site to a point 25 miles downstream, irrigating 12,218 acres in Fall River and Custer counties along the way. About 78 percent of the irrigable lands lie south of the river in an area known locally as W.G. Flat. The remaining 22 percent are on the north side in the Harrison Flat. The nearest town, Hot Springs, is about six miles northwest of the dam.

The unit consists of Angostura Dam, reservoir, main canal and irrigation distribution system, and 9,261 acres of public lands (including the facilities themselves). The 193-feet high dam is a combination of a concrete gravity structure with an earth embankment. It is 10 feet wide at the top, with a maximum width at the bottom of 230 feet. Crest length is 2,030 feet. The concrete part includes a gated spillway section in the river channel and two non-overflow sections, one extending to the left abutment, the other abutting the earth embankment and extending to the right abutment. The spillway is controlled by five 50 x 30-foot radial gates. Discharge capacity is 247,000 feet^3/second (cfs). A 4½-foot diameter steel conduit through the concrete section constitutes the river outlet works, controlled by a 4-feet-square high-pressure slide gate in the valve house at the downstream end. Discharge capacity is 590 cfs.

The main canal outlet works for irrigation delivery consists of a 6-foot diameter steel conduit through the concrete dam, ending in a valve house, stilling basin, and canal headwords at the downstream end. Releases into the canal are controlled by two 3½-foot-square high-pressure slide gates in the valve house. The main canal is about 30 miles long, conveying water from the reservoir generally towards the northeast. Bottom width of a typical section is 14 feet, with side slopes of 2:1. Water depth is 5.2 or 5.51 feet, respectively, for the earth-lined and the membrane-lined sections of the canal.

The latest sedimentation survey from 1979 indicates Angostura Reservoir has a total capacity of 130,770 acre-feet at an elevation of 3187.2 feet, 82,443 acre-feet active capacity, and a dead and inactive storage of 48,327 acre-feet. The reservoir has a surcharge capacity of 56,360 acre-feet used for flood control in conjunction with conservation storage. The 1979 survey showed that an average sedimentation rate of 985 acre-feet/year has occurred since 1949.

Management of public lands at the Angostura Unit are the responsibility of the South Dakota Department of Game, Fish and Parks (SDGFP) under an agreement with Reclamation. About 1,500 acres on the east shore of the reservoir have been classified a State Recreation Area, with campgrounds, boat ramps, marina, cabin areas, day-use area, and beach. The rest of the public lands (about 3,150 acres along the west and south shores) are managed mainly for wildlife, although there are some boat docks and facilities there also.

Angostura Irrigation District and Operation of the Unit

The Angostura Irrigation District assumed responsibility for operation and maintenance of the unit under a January 1, 1968, contract. Under this contract, Angostura Reservoir provides water to the district to irrigate 12,218 acres below the dam along both sides of the Cheyenne River. Temporary water service contracts for irrigating another 184.8 acres when the reservoir is above elevation 3,184.2 feet have been signed with the Hot Springs Airport (139.8 acres) and two private landowners (45 acres). These lands are within district boundaries, but are not part of the original authorization for irrigation. District lands are located on alluvium terraces and upland soils from the reservoir downstream for approximately 24 miles.

The reservoir is operated primarily to serve irrigation needs. Water is directly diverted from Angostura Reservoir and delivered through the 290-cfs main canal. The canal, extending from the dam along the south edge of the unit, serves about 78% of district lands before crossing under the river though a 9,800-foot inverted siphon to serve the remaining 22% of the lands. Irrigation is by gravity. Average releases to district lands are about 40,000 acre-feet/year, providing an average onsite farm delivery of 2.5 acre-feet/acre. Thirty-nine miles of laterals and 21 miles of open and closed drains serve individual farms.

Angostura and the Tribes

The Cheyenne River also forms the northwest corner of the Pine Ridge Reservation in an area known as Red Shirt Table, and the southern boundary of the Cheyenne River Reservation. The Lower Brule Indian Reservation on the Missouri River are also interested because of their interest in the Black Hills region.

Reflection On Past History

The Angostura Unit will pass a major milepost on its 50th birthday in 1999. Looking back over its first five decades, the dam initiated a variety of recreational activities and laid the foundation for irrigated farming. However, low flows were the undoing of plans to provide added hydroelectricity. The first phase of the Angostura story is closed. The length of the next chapter depends on the ingenuity of science and the calculation of nature.

NEPA PROCESS

Environmental Impact Statement? Alternatives? Record of Decision? Where do these words come from? The answer is the National Environmental Policy Act (NEPA), passed by Congress in 1969. The purposes of the Act were to ensure that the public was informed of federal actions, and to give the public a voice in federal decision-making. Federal actions (with a few specific exceptions) require some form of NEPA document. In the case of a new water service contract at Angostura Reservoir, the proper document was determined to be an EIS. The EIS is a report of significant impacts of an action, and a reasonable range of alternatives to the action, which allows decision makers and the public to compare plans and make the best choice among them.

The scoping meetings in April and May 1997 were part of the EIS process. The next step--which the study team is doing now--is to write a *draft* EIS, expected to be completed in the spring of 1998. The draft EIS will be filed with the Environmental Protection Agency (EPA), and mailed to agencies and people on our mailing list. After a set period for public review, the study team revises the draft EIS into the *final* EIS incorporating public comments where appropriate. The final EIS is also filed with EPA. The final EIS is followed by a *Record of Decision*, which will indicate the alternative Reclamation selected. Only after completing the NEPA process can the federal action proceed.

ALTERNATIVES

Meetings in Rapid City, Hot Springs, Lower Brule, Eagle Butte, and Kyle in April and May were very fruitful in bringing up concerns of the public; other concerns were brought up in comment letters received after the meetings. The Reclamation study team categorized concerns into these headings: water quality; water rights; water use; sedimentation; Indian trust assets; irrigation operations; water service contract; reservoir operations; economics; fisheries; wildlife; riparian habitat; and recreation .

Concerns within the scope of the EIS (along with other information) were used by the study team August 12-13 to develop a reasonable range of alternative plans for managing water at Angostura Reservoir. The alternatives were presented to the Cooperating Agencies at the September 16 meeting in Rapid City, where some changes were suggested. The changes have been made. The alternatives will be fleshed out with detail and further refined as the EIS progresses. The alternatives are:

No Action Alternative. This alternative would include a water service contract with the Angostura Irrigation District under new Reclamation policy -- 25-year maximum period, 5-year reviews of rates -- to irrigate a maximum of 12,218 acres in the district (which irrigated an average of 9,570 acres in 1985-1993) at the rate of 2½ acre-feet of water/acre. Maximum diversion from the reservoir for irrigation would be 48,000 acre-feet/year. Flows in the Cheyenne River downstream for recreation, fisheries, or the riparian zone along the river would depend on the water available in the reservoir, but in any case would be secondary to district irrigation. Updating of the district water conservation plan would continue.

Re-establishment of Natural Flows Below the Dam Alternative. New operating criteria in the reservoir would re-establish as nearly as possible natural flows in the river downstream (stock dams upstream of the reservoir, groundwater pumping, and changes in farming practices make complete re-establishment impossible). The dam's radial gates would be completely opened, there would be no irrigation diversions, and the surface area of the reservoir would be allowed to fall from 4,600 acres to 2,000 acres. The river downstream of the reservoir would periodically flood (up to 25,000 cubic feet per second), which would scour the river channel and the surrounding riparian zone. The river would also dry up periodically in the summer. Legislation would be required from Congress to re-authorize benefits from the reservoir.

Adaptive Water Management Alternative. The Adaptive Water Management Alternative would create a committee of the Tribes, irrigation district, the state, Reclamation, and others with an interest in water use to decide annual operating criteria at Angostura Reservoir. Water management would depend on inflows to the reservoir, with water uses given equal consideration. According to records, it would be possible to irrigate up to 10,000 acres in the district at 2½ acre-feet/acre in 35 of the 37-year period of record. Water for recreation and fisheries, riparian zone, and instream flows would be determined by the committee.

Water Conservation Alternative. This alternative would create a committee identical to the one in the Adaptive Water Management Alternative to determine water uses, but would include measures to make current water uses more efficient: a rehabilitation and betterment (R&B) project for irrigation district facilities and conversion from flood to sprinkler irrigation. It would be possible to irrigate up to 10,000 acres in the district at 2½ acre-feet/acre for 35 of the 37-year period of record. Legislation would be needed for the R&B project.

Reservoir Recreation/Fisheries Alternative. The Reservoir Recreation/Fisheries Alternative would, as its title suggests, give priority to recreation and fisheries at Angostura Reservoir beyond all other uses. The reservoir would be held at a target elevation of 3,187 feet in May and June to aid fish spawning (minimum elevation would be 3,170 feet). Target elevations at other times would be set to maximize reservoir surface area and beaches during the recreation season. Diversion for irrigation and flows for fisheries, the riparian zone along the river below the dam, and instream flows would be secondary to reservoir recreation needs. Legislation would be needed to re-authorize benefits from the reservoir.

Tribal Irrigation Projects Alternative. This alternative would give priority to irrigation on the Pine Ridge and Cheyenne River Reservations. A minimum of 400 acres (or the acreage delineated Reclamation's *Definite Plan Report*) on Pine Ridge, an acreage to be determined on Cheyenne River, and up to 12,218 acres of irrigation in the district would be irrigated, all areas at the 2½ acre-feet/acre rate. Water for recreation and fisheries, the riparian zone, and instream flows would be secondary to irrigation. Legislation may be required for this alternative.

Hydropower Alternative. The Hydropower Alternative would entail installation of a powerplant at Angostura Dam or in the river below the dam to benefit the Tribes. Water for recreation and fisheries, the riparian zone, and instream flows would be secondary to power generation. Legislation would be required.

RECENT AND FUTURE ACTIVITIES

P **August 12-13**: Angostura NEPA Team Meeting was held in Bismarck, ND, for the team to draft water management alternatives for analysis in the EIS. Six alternatives were developed using comments received from the public.

P **September 16**: Cooperating Agency Meeting was held in Rapid City to review EIS activities, present draft alternatives to cooperating agencies for their buy-in, and plan for and review upcoming EIS activities. As a result of cooperating agency input, a seventh alternative, **Hydropower,** was added for analysis. There are 10 cooperating agencies assisting Reclamation with the EIS. They include state and federal agencies, Irrigation District and Tribes.

P **September 3-6 & September 29-October 2**: Fish surveys on the Cheyenne River at Oral and Fairburn/Redshirt Table were completed between Reclamation, Oglala Sioux Tribe, Irrigation District and SD State University personnel. Fifty-five fish were caught using trap nets, hoop nets, seines, and electro-fishing equipment. These fish will be analyzed for bioaccumulation of pesticides, Pcbs, metals and trace elements.

Water quality sampling was completed with Reclamation, Irrigation District and Oglala Sioux Tribal Staff from **August 4-6.** Water and sediment samples were collected at several stations above Angostura, in the Reservoir, main canal, irrigation drains, and in the Cheyenne River. These samples will be analyzed for pesticides, Pcbs, metals and trace elements.

P **October 7-8 & 28-29**: Riparian Habitat Meeting and field work is being completed to determine the status of riparian vegetation along the Cheyenne River. Reclamation, Oglala Sioux Tribe and the U.S. Forest Service are cooperating on this riparian survey.

P **November 5**: Dennis Breitzman, Reclamation Area Manager, and John Yellow Bird Steele, President, Oglala Sioux Tribe, will meet to review EIS activities and finalize a Government-to-Government Memorandum of Agreement with the Tribe for their participation in the EIS.

P **Winter 1997/98**: Reclamation NEPA team members will be traveling to meet individually with respective cooperating agencies to collect water quality and fisheries data relevant to the EIS. Also, the team will use the winter months to write the draft EIS.

➽ Kenneth Parr, Reclamation Team Leader for the Angostura EIS, would like to thank everyone for their participation in this difficult EIS process. Because of your cooperation, Reclamation and the cooperating agencies have been able to stay on schedule.